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COLLARD & ROE, P.C.
1077 NORTHERN BOULEVARD
ROSLYN, NY 11576

EXAMINER	
MORTELL, JOHN F	
ART UNIT	PAPER NUMBER
2612	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/591,106	PILZ ET AL.	
	Examiner	Art Unit	
	JOHN F. MORTELL	2612	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *30 August 2006*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-7* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☒ Claim(s) _____ is/are allowed.

6)☐ Claim(s) *1-5* is/are rejected.

7)☒ Claim(s) *6 and 7* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *30 August 2006* is/are: a)☐ accepted or b)☒ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *8/30/2006; 10/27/2006*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Status of the Claims

1. Claims 1-7 are pending in the application. The applicant has amended claims 1-7.

Drawings

2. The drawings are objected to as failing to comply with 37 CFR 1.84(p)(5) because they do not include the following reference sign(s) mentioned in the description: "electronic circuit C," mentioned on page 8 of the disclosure in the discussion of Figure 2.

Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Specification

3. The disclosure is objected to because of the following informalities:

At the bottom of page 4, and carrying over to the top of page 5, the language intended appears to be, "... and a U-core magnetically coupled to the I-core...."

On page 5, the letter 'y' appears alone, but the language intended appears to be "by."

Page 9, includes the language, "...which switch the loads the transponder winding ...," but the intended language appears to be, "... which switch loads the transponder winding ...."

Appropriate correction is required.

Claim Rejections - 35 USC § 102

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office Action:

> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

5. Claim 1 is rejected under 35 U.S.C. 102(b) as being anticipated by D'Hont (US 5,491,483).

Regarding claim 1, D'Hont teaches:

> a device for the wireless transmission of electricity for the generation of at least one supply voltage for one or more electrical consumers which, if necessary, is/are arranged on a rotary device (col. 6, lines 10-20, 59-67; FIG. 4; FIG. 6),

wherein a first coil connected to a supply device forms the primary winding and a ring conductor forms the secondary winding of a transformer (col. 6, lines 5-9; FIG. 4: 18, 20, 24), and

a second coil is inductively coupled to the ring conductor to which coil an electrical consumer is connected (col. 4, lines 21-28; col. 6, lines 5-20; Fig. 4: 14).

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

7. Claims 2 and 3 are rejected under 35 U.S.C. 103(a) as being unpatentable over D'Hont (US 5,491,483) in view of Buenz et al. (US PG Pub. 2005/0046558 A1).

Regarding claim 2, D'Hont teaches the device according to claim 1, and D'Hont further teaches a device wherein:

> the supply device (15) comprises a supply, receiving and a transmitting unit designed as a load modulator, in that the electrical consumer (A) is designed as an electronic circuit which comprises a transmitting unit (13), a processing and control unit (ii), and a storage unit (12) and in that the ring conductor (2) consisting of a flexible material is arranged coaxially, and the supply device (15) and the first coil (4) are arranged stationarily (col. 4, lines 21-28, 33-35; col. 6, line 59 – col. 7, line 6; FIG. 1: 16, 18, 22; FIG. 6; D'Hont incorporates by reference Schuermann (US 5,479,171), which teaches an elastic antenna routed loosely about the circumference of the sidewall of a tire, having a coupling coil at one end located close to a transponder, and coupled magnetically by

> the coupling coil to the transponder, which is mounted in a stationary position relative to the rotating tire. (col. 2, lines 5-13; col. 3, lines 11-16, 28-42; FIG. 2; FIG. 3)).

D'Hont does not teach a device wherein the supply device comprises:

> at least one sensor element and a rectifier and smoothing circuit, in that the rectifier and smoothing circuit is connected to the second coil, and the second coil and the electrical consumers are arranged on or in a rotary device.

Regarding claim 2, Buenz, in the same field of endeavor, teaches a wireless tire pressure sensing system comprising:

> at least one sensor element and a rectifier and smoothing circuit, in that the rectifier and smoothing circuit is connected to the second coil, and the second coil and the electrical consumers are arranged on or in a rotary device,

for the benefit of providing a compensated pressure reading of the tire. ([0006], [0036], [0054])

It would have been obvious to one of ordinary skill in the art at the time of the invention to combine the wireless tire pressure sensing system comprising:

> at least one sensor element and a rectifier and smoothing circuit, in that the rectifier and smoothing circuit is connected to the second coil, and the second coil and the electrical consumers are arranged on or in a rotary device,

as taught by Buenz, with the device taught by D'Hont because it would enable the device to provide compensated pressure readings of a tire.

Regarding claim 3, the above combination teaches the device according to claim 2, and Schuermann, incorporated by reference into D'Hont, further teaches a device wherein:

> the rotary device is a motor vehicle tyre, wherein the diameter of the ring conductor (2) is greater or smaller than the diameter of the

metal belt of the tyre (col. 3, lines 43-52; FIG. 4a; FIG. 4b), and in that the supply device (15) is arranged with the first coil in the wheel housing region of a motor vehicle. (col. 3, lines 11-16, 28-42; FIG. 2; FIG. 3)

8. Claims 4 and 5 are rejected under 35 U.S.C. 103(a) as being unpatentable over D'Hont (US 5,491,483) in view of Buenz et al. (US PG Pub. 2005/0046558 A1), further in view of Okumura (US PG Pub. 2004/0066288 A1), further in view of Huang (US 6,446,764 B1), and further in view of Koch et al. (US 5,500,065)

Regarding claim 4, the above combination teaches the device according to claim 2, which supplies voltage to a transponder arranged in or on a vehicle tire (see the citations for claims 1 and 2), and further teaches a device wherein:

a transponder component is arranged in or on each tyre, which component comprises a circuit board (PCB) with an electronic circuit, which incorporates a pressure and/or temperature sensor, a transponder circuit with receiving, transmitting and signal processing components and a rectifier and smoothing circuit, a coupling coil connecting the input terminals of the electronic circuit and surrounding an I-core, and a U-core magnetically coupled to the I-core, and is surrounded by an envelope connected to the tyre. (See the citations for claims 1-3.); and

each tyre has a ring conductor arranged coaxially, penetrating the U-core and hence coupled inductively to it, and consisting of flexible material, the diameter of which ring conductor is greater or smaller than the diameter of the metal belt of the tyre. (See the citations for claims 1-3.)

The above combination does not teach a device according to claim 2 for the data transmission between the transponder and a vehicle processing unit, wherein

a wheel housing unit is connected to the vehicle processing unit for each traveling wheel, which wheel housing unit comprises an interface unit connected to a bus system, a control unit, a storage unit, an HF signal generator, a modulator/demodulator; and

a transponder component is surrounded by an envelope provided with an air inlet and connected to the tyre.

Regarding claim 4, Okumura, in the same field of endeavor, teaches:

> a wheel housing unit ([0031], [0057]; FIG. 1: 62; FIG. 7) is connected to the vehicle processing unit ([0028], [0031], [0035]; FIG. 1: 80) for each traveling wheel (FIG. 1: 51, 52, 53, 54), which wheel housing unit comprises an interface unit ([0035]; FIG. 2B: 81, 82) connected to a bus system (FIG. 1), a control unit (FIG. 2B: 83), a storage unit ([0028], [0034], [0039]; FIG. 2B: 83), a signal generator (FIG. 2B: 83, 84, 85), and a modulator/demodulator ([0034], [0039]; FIG. 2B: 82, 83, 84, 85),

for the benefit of grasping the tire position at which each of the sensor units exists, even in the case of the tire rotation, without requiring the complicated registration operations ([0008]).

It would have been obvious to one of ordinary skill in the art at the time of the invention to combine the

> wheel housing unit ([0031], [0057]; FIG. 1: 62; FIG. 7) is connected to the vehicle processing unit ([0028], [0031], [0035]; FIG. 1: 80) for each traveling wheel (FIG. 1: 51, 52, 53, 54), which wheel housing unit comprises an interface unit ([0035]; FIG. 2B: 81, 82) connected to a bus system (FIG. 1), a control unit (FIG. 2B: 83), a storage unit ([0028], [0034], [0039]; FIG. 2B: 83), an HF signal generator (FIG. 2B: 83, 84, 85), a modulator/demodulator ([0034], [0039]; FIG. 2B: 82, 83, 84, 85),

as taught by Okumura, with the device taught by the above combination because it would enable the device to grasp the tire position at which each of the sensor units exists, even in the case of the tire rotation, without requiring the complicated registration operations.

The above combination of D'Hont, Buenz, and Okumura does not teach a device wherein a wheel housing unit comprises an interface unit connected to an HF signal generator.

Regarding claim 4, Huang, in the same field of endeavor, teaches an apparatus that can monitor the pressure condition in pneumatic tires of the wheel units of an automobile, wherein a signal generating loop is controlled by a processing unit to generate a periodic high frequency signal to the excitation unit for the benefit of enabling the processing unit to determine the pressure condition in the pneumatic tire. (col. 1, lines 50-54; col. 5, lines 49-60; FIG. 14: 24, 232", 236)

It would have been obvious to one of ordinary skill in the art at the time of the invention to combine the apparatus that can monitor the pressure condition in pneumatic tires of the wheel units of an automobile, wherein a signal generating loop is controlled by a processing unit to generate a periodic high frequency signal to the excitation unit, as taught by Huang, with the device taught by the above combination because it would enable the processing unit of the device to determine the pressure condition in the pneumatic tire.

The above combination of D'Hont, Buenz, Okumura, and Huang does not teach does not teach a device wherein a transponder component is surrounded by an envelope provided with an air inlet and connected to the tyre.

Regarding claim 4, Koch, in the same field of endeavor, teaches a method for monitoring the internal pressure of a tire, wherein a monitoring device is mounted on an interior surface of the tire by encasing it within an encasement or encapsulating material, or placing it in a flexible housing such as a pocket or cover, all of which have an opening or aperture to allow an air path to the sensor so it can measure the internal tire pressure for the benefit of avoiding exposing

the sensor to damage from weather or vandalism, of avoiding introducing additional sealed joints from which air may leak, and of avoiding having a sensor become disassociated from a particular tire which is being monitored. (col. 1, lines 44-53; col. 1, line 64 – col. 2, line 7; col. 3, lines 31-36, 41-45, 53-60; col. 4, line 45-55; FIG. 6: 18, 46; FIG. 7: 17, 84; FIG. 8: 17, 84)

It would have been obvious to one of ordinary skill in the art at the time of the invention to combine the monitoring device is mounted on an interior surface of the tire by encasing it within an encasement or encapsulating material, or placing it in a flexible housing such as a pocket or cover, all of which have an opening an opening or aperture to allow an air path to the sensor so it can measure the internal tire pressure, as taught by Koch, with the device taught by the above combination because it would enable the device to avoid exposing the sensor to damage from weather or vandalism, to avoid introducing additional sealed joints from which air may leak, and to avoid having a sensor become disassociated from a particular tire which is being monitored.

Regarding claim 5, the above combination teaches the device according to claim 4 and further teaches a device

> wherein the wheel housing unit is provided with a first antennae acting as a receiving antenna for modulated data signals, and a second antenna acting as a transmitting antenna for an HF carrier signal, wherein the first antenna is arranged in the wheel housing so that it is located in a region of minimum field strength of the second antenna.

(See the citations for claims 1-4. In particular, Okumura teaches a first antenna acting as a receiving antenna for modulated data signals ([0035]; Fig. 1; FIG. 2B:

81, 82) and a second antenna acting as a transmitting antenna for a carrier signal ([0035]; FIG. 1; FIG. 2B: 61). As shown in the rejection of claim 4 above, Huang teaches that the transmitting antenna transmits a high frequency signal. As cited in the rejection of claim 2 above, Schuermann, incorporated by reference in D'Hont, teaches a coupling distance between the unit on the tire and the unit in the wheel housing. The outer limit of the coupling distance is the region of minimum field strength of the second antenna. (col. 3, lines 11-16, 28-42)

The choice to connect the second antenna to the wheel housing by means of a twisted or double cable with conductors assembled close together would have been an obvious design choice to one of ordinary skill in the art at the time of the invention that does not produce any new or unexpected result.

Allowable Subject Matter

9. Claims 6 and 7 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

The following is a statement of reasons for the indication of allowable subject matter:

Regarding claim 6, the above combination teaches the device according to claim 4 and further teaches a device wherein the power supply is fed to the transponder component when:

> the carrier signal is transmitted via the transmitting antenna of the wheel housing unit (D'Hont: col. 6, lines 16-20; FIG. 4: 24),

the magnetic alternating field thus generated induces an alternating current flowing in the ring conductor (D'Hont: col. 6, lines 5-15; D'Hont teaches an antenna in the form of a ring conductor coupled to an impedance transformer, which, together with a capacitor, forms a resonant circuit that oscillates in response to the receipt of a signal and then serves as a carrier wave generator for the transmission of a response signal. One of ordinary skill in the art would know that the transmission of a response signal is possible only because the oscillation of the impedance transformer induces an alternating current flowing in the ring conductor),

this alternating current generates a magnetic flux in the U-core (K) crossing the ring conductor (RL) and in the connected I-core (IK) (See the previous citation. One of ordinary skill in the art would understand that, pursuant to Faraday's Law, the alternating current in the ring conductor would induce magnetic flux in the U-core crossing the ring conductor and the connected I-core.), and

the magnetic flux in the coupling coil (L) induces an alternating current voltage which is converted by means of the rectifier and smoothing circuit (GG) to at least one operating d.c. voltage (UB) (See the previous citation. One of ordinary skill in the art would understand that, pursuant to Faraday's Law, the alternating current in the ring conductor would induce magnetic flux in the U-core crossing the ring conductor and the connected I-core. This magnetic flux would induce an alternating current in the coil around the I-core. As cited above in the rejection of claim 2, Buenz teaches that the sensed signal is received and rectified by a full wave rectification circuit, producing at least one operating d.c. voltage.), and

the data transmission from the transponder component (T) to the wheel housing unit (RE) takes place when:

the HF carrier signal is transmitted via the transmitting antenna of the wheel housing unit (See the citations to claims 1-4. D'Hont teaches that the transponder transmits data by a response signal after receiving a signal at the proper frequency. Okumura teaches that the transmitter antenna is located in the wheel housing, and Huang teaches that the carrier signal is high frequency. (See the citations to claims 1-4, and see D'Hont: col. 4, lines 21-26),

the auxiliary carrier signal is modulated with low frequency data signals obtained by means of the sensor and processed by means of the signal processing unit (See the citations for claims 1-4, and

> see Okumura: [0043], [0044], [0045]; D'Hont teaches that in response to an interrogation signal, the transponder transmits a response signal carrying identification or other information. One of ordinary skill in the art would know that an identification signal is produced by modulating a carrier signal with identification data. Furthermore, Okumura teaches the transmission of air pressure measurement values in response to a trigger signal. One of ordinary skill in the art would know that the transmission of such values is accomplished by modulating a carrier signal.)

The above combination does not teach a device wherein the data transmission from the transponder component (T) to the wheel housing unit (RE) takes place when:

> the carrier signal is transmitted to a frequency divider parallel with the rectifier and smoothing circuit, thereby generating an auxiliary carrier signal,
>
> a switch is controlled by means of the modulated auxiliary carrier signal, which switch loads the transponder winding with a resistance so that side band frequency signals modulated with the data signal are generated, the frequencies of which signals have distances of whole number multiples of the frequency of the auxiliary carrier signals from the HF carrier signal,
>
> the signal mixture is transmitted by the transponder (T) and is received via the receiving antenna (AE) from the wheel housing unit (RE) in which the modulated auxiliary carrier signals are separated by partial suppression of the carrier signal, amplification and mixing on a non-linear characteristic,
>
> each signal, from the multiplicity of the modulated auxiliary signals, is filtered out and demodulated with the auxiliary carrier frequency originally obtained from the HF carrier signal by frequency division so that the data signals are processed and transmitted via the interface to the bus system.

Regarding claim 6, Monson (US 5,824,891), in the same field of invention, teaches a method and apparatus for measuring the pressure of the gas within a vehicle wheel, wherein:

> the carrier signal is transmitted to a frequency divider parallel with the rectifier and smoothing circuit, thereby generating an auxiliary carrier signal,

for the benefit of remotely powering a transponder through inductive coupling while efficiently phase modulating data generated by the transponder and transmitting the data to the transceiver through inductive coupling. (col. 1, lines 13-17; col. 2, lines 28-32; col. 4, lines 30-42; col. 5, lines 26-27; FIG. 4: 204, 280)

It would have been obvious to one of ordinary skill in the art at the time of the invention to combine the method and apparatus for measuring the pressure of the gas within a vehicle wheel, wherein:

> the carrier signal is transmitted to a frequency divider parallel with the rectifier and smoothing circuit, thereby generating an auxiliary carrier signal,

as taught by Monson, with the device taught by the above combination because it would enable the device to remotely power a transponder through inductive coupling while efficiently phase modulating data generated by the transponder and transmitting the data to the transceiver through inductive coupling.

Neither the above combination of D'Hont, Buenz, Okumura, Huang, and Monson, nor any other prior art teaches a device according to claim 4, wherein the data transmission from the transponder component to the wheel housing unit takes place when:

> a switch is controlled by means of the modulated auxiliary carrier signal, which switch loads the transponder winding with a resistance so that side band frequency signals modulated with the data signal are generated, the frequencies of which signals have

distances of whole number multiples of the frequency of the auxiliary carrier signals from the HF carrier signal,

the signal mixture is transmitted by the transponder (T) and is received via the receiving antenna (AE) from the wheel housing unit (RE) in which the modulated auxiliary carrier signals are separated by partial suppression of the carrier signal, amplification and mixing on a non-linear characteristic,

each signal, from the multiplicity of the modulated auxiliary signals, is filtered out and demodulated with the auxiliary carrier frequency originally obtained from the HF carrier signal by frequency division so that the data signals are processed and transmitted via the interface to the bus system.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to JOHN F. MORTELL whose telephone number is (571)270-1873. The examiner can normally be reached on IFP.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jeffrey A. Hofsass can be reached on (571)272-2981. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-

free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/JM/

/Jeff Hofsass/

Supervisory Patent Examiner, Art Unit 2612